North Central Texas Council of Governments

Dallas-Fort Worth CLEAN CITIES

Planning Resilient EV Charging

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NCTCOG Transportation Department

NTX-REV Stakeholder Input Session

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DOE Acknowledgement

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Agenda

Kickoff

The Need for Resilient EV Charging

Check In: Questions?

Scope Overview and Establishing Regional Objectives, Outputs, & Outcomes

Framing the Project

Check In: Questions?

Resilient Charging Technologies and Strategies

Introduction, Comparison, and Regional Adaptations

Gap and SWOT Analyses

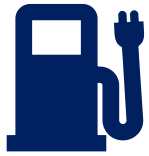
Check In: Questions?

Final Remarks

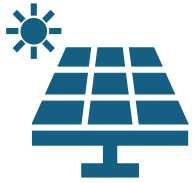
Transportation Department: Clean Fuels & Energy

Key Focus Areas & Goals

Clean Vehicle Initiatives



Alternative Fuel Infrastructure Initiatives



Energy Integration & Community Readiness

What We Do

Funding Support

Technical Assistance

Planning the Future

Raising Awareness

Emergency Preparedness Department

Key Focus Areas & Goals

- Regional EV Infrastructure Resiliency Plan
- Administer Table-top Exercise
- Assist with field demos and workshop

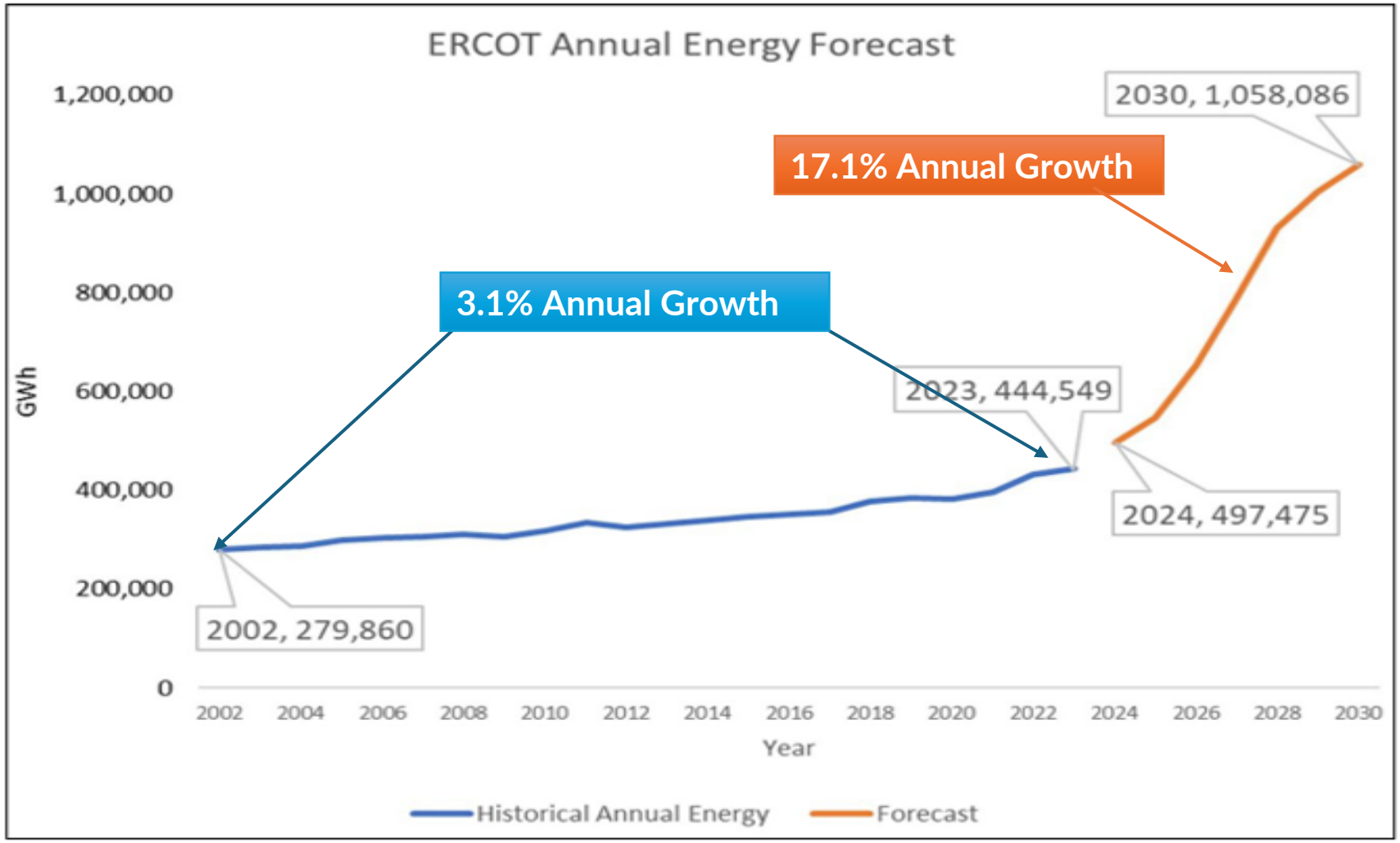
What We Do

- Grants Management and Administration
- Regional Planning Support
- Training and Exercise Support
- Facilitate Regional Working Groups and Committees

The Need for Resilient Electric Vehicle Charging

Image Provided By Dallas Area Rapid Transit

Why: Increasing Demand on the Grid



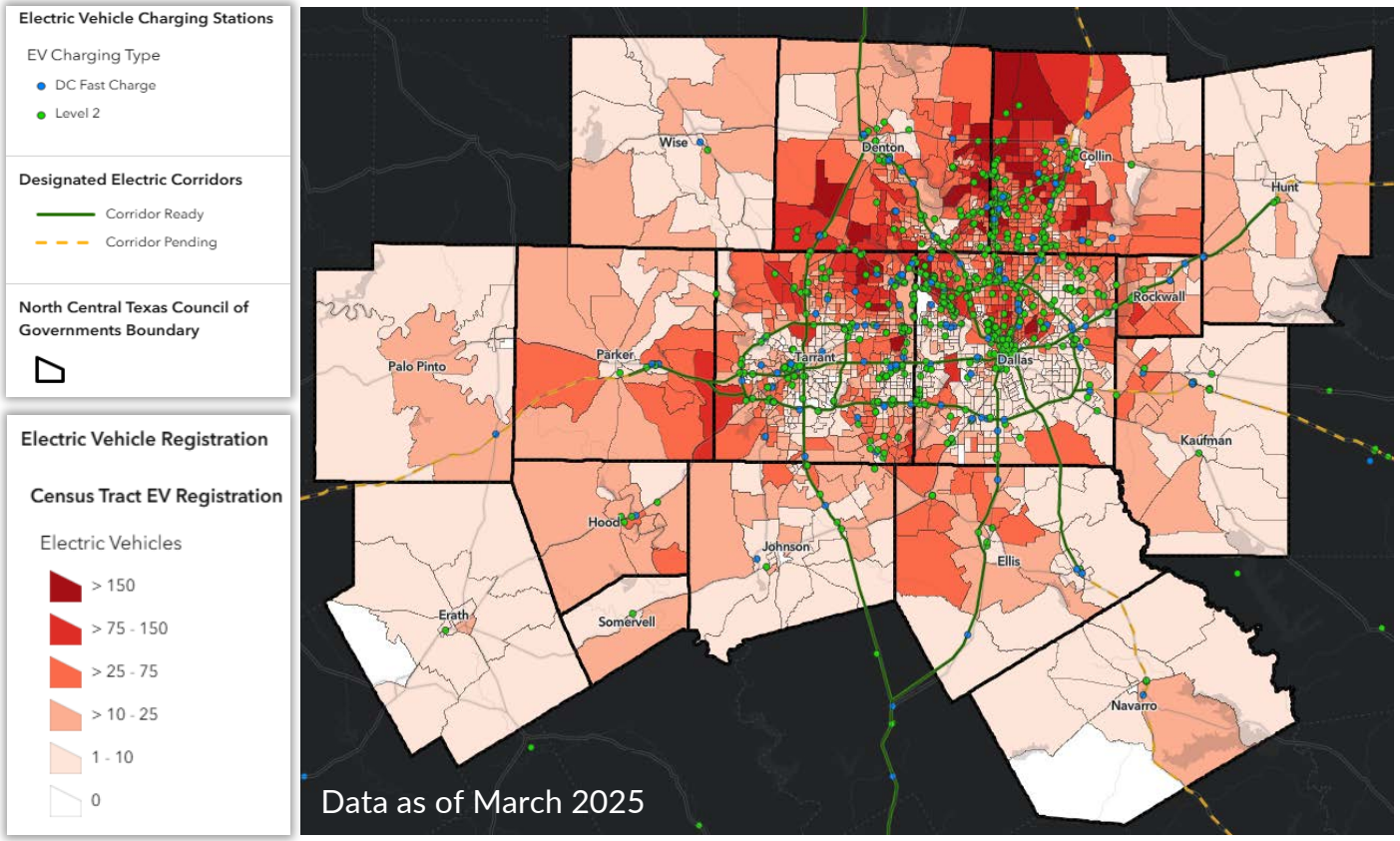
Largest contributors to demand increase (Large Load)

Cryptocurrency mining
Data centers – AI usage contributing factor
Hydrogen production
Large industrial

1 Gigawatt Hour (GWh) could power: ~ 1.1 million homes for an hour; 1 electric car for 3 million miles

Source: www.ercot.com/gridinfo/load/forecast ->Long-Term Hourly Peak Demand and Energy Forecast

Why: Increasing EV Adoption



ERCOT projects 998,000 light-duty and 103,000 medium- and heavy-duty EV by 2029

EVs will be increasingly assigned to critical operations (ex: public safety, public works, freight transport, etc.)

However, EV charging only expected to add 1.25% by 2029

Electric Vehicle (EV) Registration Data

dfwcleancities.org/evnt -> EVs and Texas

Region	March 2024	March 2025	Increase
Texas	259,339	357,334	38%
Dallas-Fort Worth (DFW)	**96,238**	**131,114**	**36%**
Austin	51,083	70,489	38%
San Antonio	23,715	30,512	29%
Houston	64,196	90,045	40%

Charging Ports Statewide (includes Tesla):

- 7,460 Level 2
- 3,249 DC Fast

afdc.energy.gov/stations

Why: Decreasing Grid Reliability

- More outages in last 5 years than any other state
- Outages lasted ~160 minutes impacting an est. 172,000 Texans
- Most outages caused by severe weather and failure of systems operations
- **Other possible causes:** Aging Infrastructure, Vandalism, Transmissions Operations, Natural Disaster, Physical Attack, or Other

Cause of Outage	Outages Last 5 Years (2019-2023)	Outages Last 20 Years (2003-2023)	Percent of Outages in Last 20 Years Occurring in Last 5 Years
Severe Weather	111	193	58%
Systems Operations	45	62	73%
All Causes	**263**	**435**	**60%**

Source: Payless Power

Questions?

Image Provided By Dallas Area Rapid Transit

Scope Overview and Establishing Regional Objectives, Outputs, & Outcomes

Image Provided By Dallas Area Rapid Transit

Source: Getty

Setting the Scope

Objective:

- Create North Texas Resilient Electric Vehicle (NTX-REV) plan for 16-county NCTCOG region to **continue critical electric vehicle operations**

Outputs:

- Draft and final NTX-REV Plan
- Updated Hazard Mitigation guidance

Outcomes:

- Increased awareness and understanding of the risks and potential solutions surrounding electrification of critical EV operations and EV charging
- Improved readiness in the event disruption occurs

Timeline

ober 2024- July 2025*

Research and Engagement
NTX-REV Plan Drafting

ust 2025 – September 2026*

Demo Project Development & Implementation

tober 2026 – March 2027*

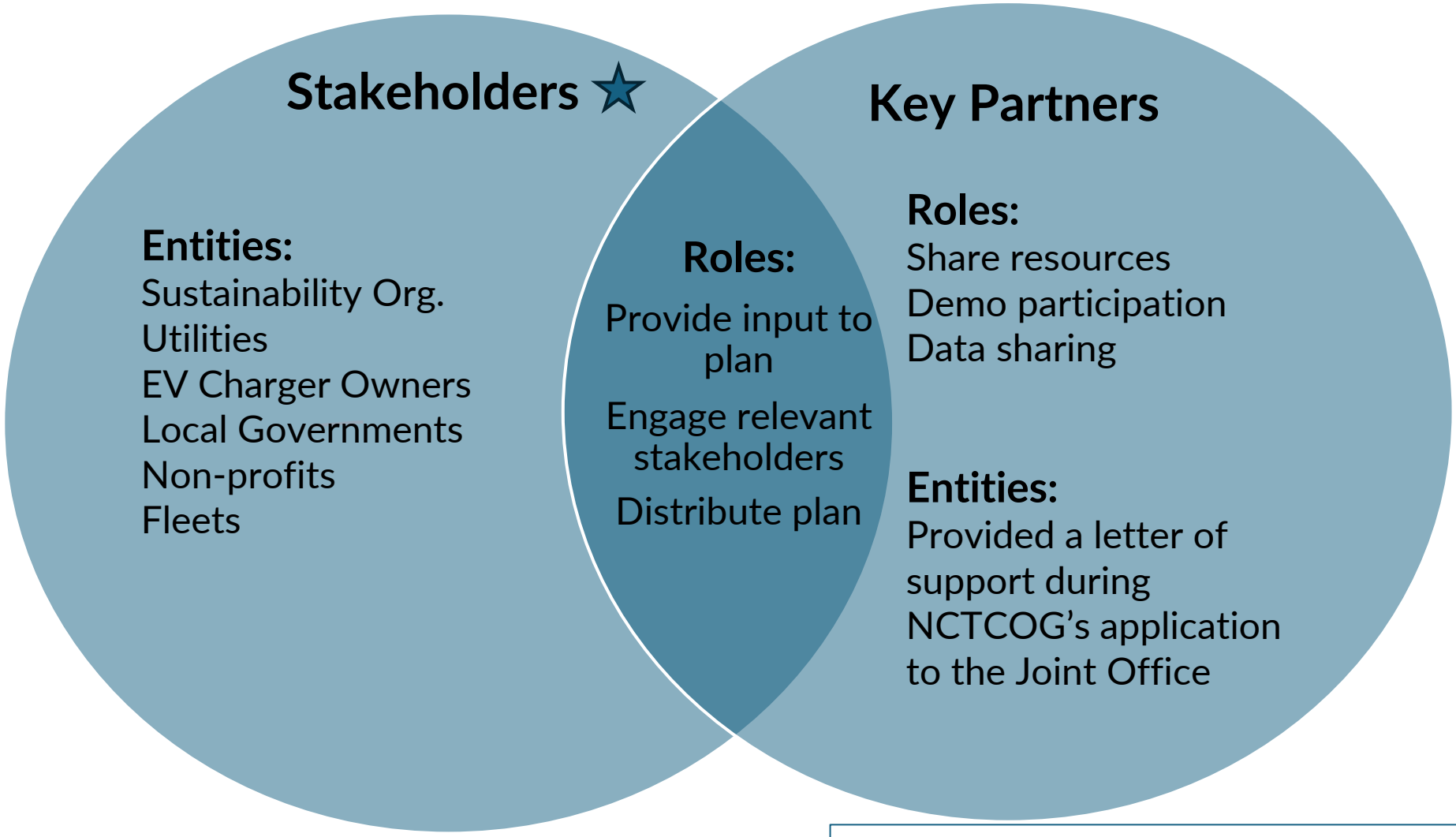
Plan Finalization and Distribution

adjusted pending DOE approval

Sample Plan Outline

- Introduction to Region
- Purpose of the Project
- Project Objectives
- Scope
- Assumptions
- Roles and Responsibilities
- SWOT Analysis
- Gap Analysis
  - Critical EV Infrastructure/Assets
  - Areas to Add Resilient EV Infrastructure
- Resources

NTX-REV Project Team



Project Manager

NCTCOG
Transportation Department
Emergency Preparedness Department

Role:
Coordinate Meetings
Create Plan
Manage/Project and Budget

Know someone who may be interested? Please share the NTX-REV flyer or sign-up form available at www.cleancities.org/NTx-REV

Discussion

- What would you like to get out of this project?

- What do you think is important for us to include?

Discussion

- What concerns do you need to address about critical EV/ grid resilience?

- What are issues is your organization seeing in the field?
  - Ex. No backup methods of charging, issues with response time, difficulties with repairs, sourcing vendors/parts, etc.

Resilient Charging Technologies

Image Provided By Dallas Area Rapid Transit

Potential Resiliency Technologies

Technology	Independent Source of Power?	Storage for Off-Grid Charging
Energy Storage Systems: Batteries or Hydrogen Fuel Cell		Yes
On Site Renewable Generation: Solar or Wind	Yes; Intermittent	
Generators: Gasoline, Natural Gas, or Diesel	Yes	Yes
Mobile Charging: Mobile Charging Unit or Vehicle to Vehicle Charging		Yes
Microgrids	Yes	Yes

See Whitepaper titled, "Planning for Resilient EV Charging Infrastructure". Developed by NCTCOG The Texas State Energy Conservation Office (SECO). Highlights key strategies for achieving resilient EV charging

Energy Storage Systems

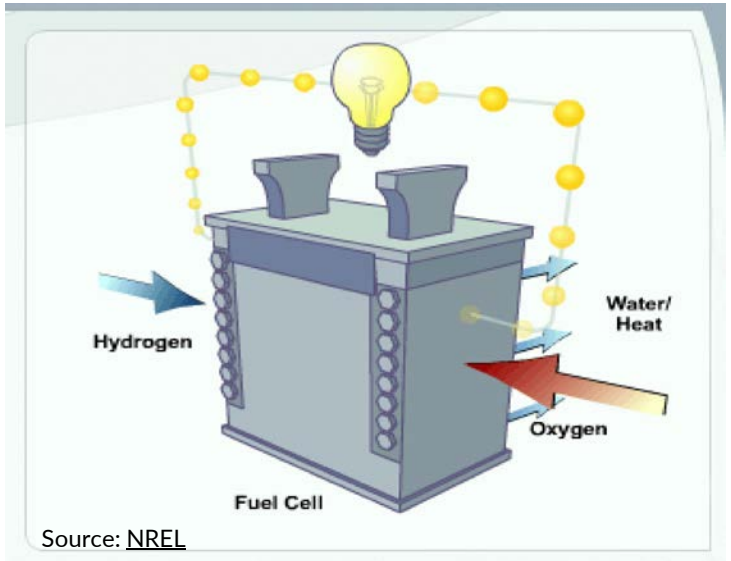
Battery Energy Storage System (BESS) and Hydrogen Fuel Cell Energy Storage

Lessen grid impact; scalable; standalone or connected to the grid

Battery integrated chargers allow for off-grid charging

Offer backup power and stationary power for electricity generation used in microgrids and larger scale applications

Source: NREL



Source: NREL

On Site Renewable Generation

Solar and Wind

- Lessen grid impact; scalable; can be integrated as a DER
- Off-grid capable when integrated with energy storage (usually battery)
- Added energy storage needed for long term resiliency
- Low lifecycle emissions
- Efficiency gains when locally deployed

Generators

Powered by a variety of fuel sources: propane, diesel, natural gas

Combustion-fueled generators:

- Lower upfront cost compared to battery and solar backup
- Higher power density and fuel efficiency
- Depending on size could be mobile
- Propane's carbon intensity is lower than electricity generated from the Texas grid mix

Source: Texas Propane Gas Association

Mobile Charging

Electricity generation can be from energy storage (battery, supercapacitors, or hydrogen fuel cell), propane, natural gas, or diesel

Larger scale platforms can accommodate charging multiple vehicles

Deploy at any location

- No need for permits, electrical upgrades, or construction

Source | NREL

Bidirectional Charging

EVs able to discharge energy from the battery

- A type of mobile energy storage
- Provides alternating current to something else
- Offer backup power in case of emergency

Focusing in on critical EV operations, the most relevant strategy would be:

Vehicle-to-Vehicle (V2V)

- Possible with proper plug adapter and charging connector

Source Autocar India

Microgrids

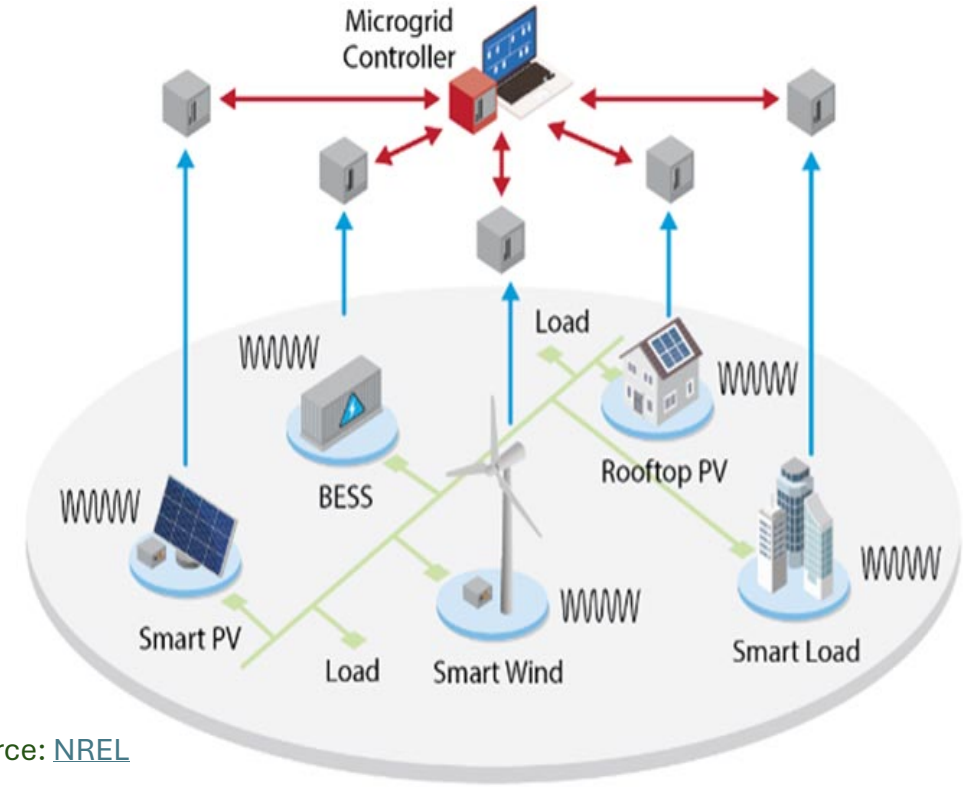
A combination of distributed energy resources (DERs) and electrical loads working as one unit

Can operate connected to the grid or off-grid ("island" mode)

Increased power transmission efficiency due to closer proximity to users

Reduces peak demand pressures enhancing overall energy security

Can include more renewable energy sources than the macro-grid; Scalable



Source: NREL

Discussion

- What resilient technologies or strategies are you interested in? Do you have experience you would like to share?
- Any you are not interested in or don't find suitable for the region or your organization?

Gap Analysis and SWOT Analysis

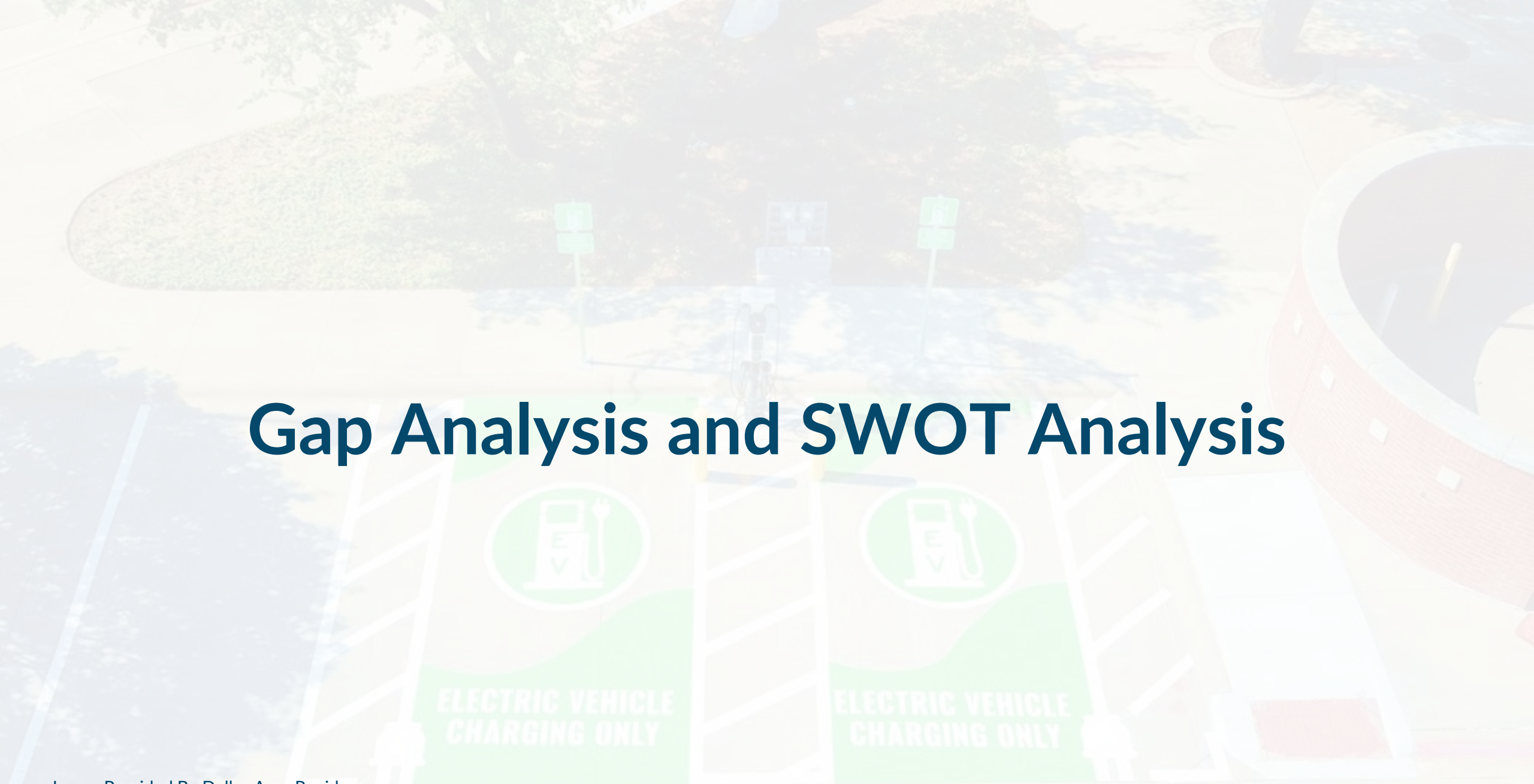


Image Provided By Dallas Area Rapid Transit

Source: Getty Images

GAP and SWOT Analyses

SWOT Analysis

- Measure current ability of region to maintain critical operations during grid failure
  - **S**trengths- What assets do we currently have to support our resiliency?
  - **W**eaknesses- Where are current risks?
  - **O**pportunities- What areas could we improve to better support resiliency?
  - **T**hreats- Obstacles that would preclude us from implementing the plan?

Gap Analysis

- Identify difference between resilient charging infrastructure **currently** in the region vs what infrastructure and resiliency strategies are **needed**

SWOT Analysis

Strengths

Local Vehicle Electrification Plans and Goals
Local Emergency Preparedness and COOP Plans
Charging Infrastructure
Various Energy Sources
Regional Support and Mutal Aid Agreements

Weaknesses

ERCOT Grid Capacity and Constraints
Length of Outages and Frequency

Opportunities

Identify Critical Transportation Assets and Operations
Funding to Deploy Resiliency
Filling Gaps In Existing Local Vehicle and Infrastructure Electrification Plans
Peer Sharing

Threats

Rapid Population and Economic Growth
Frequency of Severe Weather

Gap Analysis: Resilient Infrastructure Currently In Region

Resilient EV Infrastructure Inventory

Owner	Location	Strategy	Additional Resiliency Needed?
City of Irving	Library	Battery System	Potentially
Xcharge North America	City of Allen	Battery System with 3MWh	Potentially
City of Dallas	City of Dallas	Microgrid	Potentially

Potential Critical Transportation Assets

Owner	Vehicle Type	Vocation	Electric?
City of Plano	Electric sedan	Public Safety	Some
City of Plano	Refuse truck	Public Safety	Planned
Dallas Area Rapid Transit	Bus	Transit	Some
City of Denton	Fire Truck	Public Safety	Planned
City of Carrollton	Electric sedan	Public Safety	Some
Dallas County Sheriff's Office	Electric sedan	Public Safety	Some

What are the critical transportation assets in the region, or in your organization, that you want us to consider when planning?

Questions?

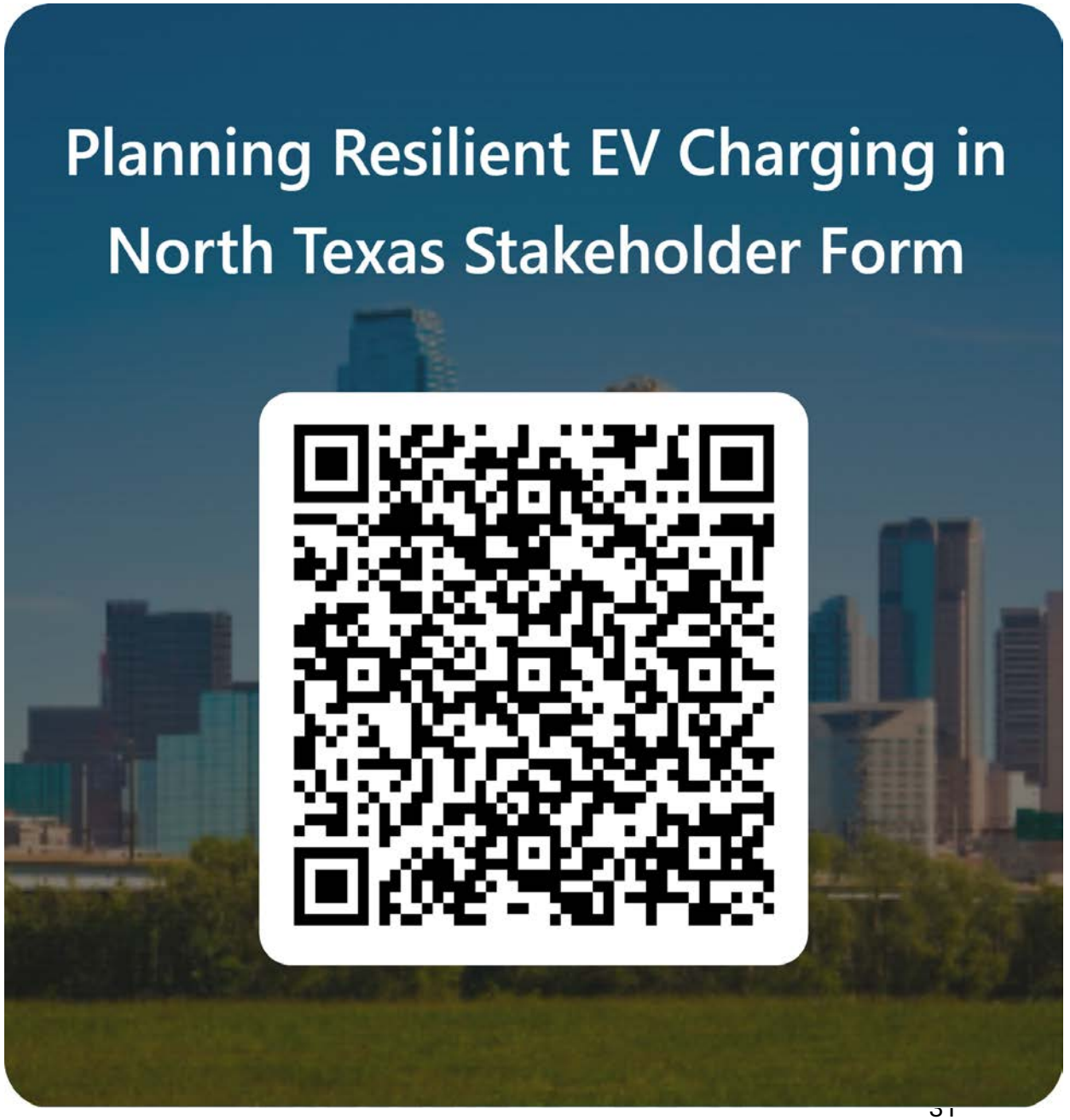
Image Provided By Dallas Area Rapid Transit

Next Steps

- Complete Stakeholder Form
  - Send form to any relevant potential stakeholders
  - Check out the informational one-pager on this project

- Stay tuned for our upcoming regional stakeholder engagement meetings
  - May 28, 2025
  - ***Potential tour May/June 2025***
  - July 30, 2025
  - September 24, 2025

- Contact us at cleancities@nctcog.org with any additional questions



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Planning Resilient EV Charging in Texas | DFWCC

Dallas-Fort Worth Clean Cities: LinkedIn

Case Studies and Whitepaper

- City of Allen, Texas - A Superhub Project by XCharge North America
- US Department of Agriculture Forest Service – Remote Charging Station
- City of Phoenix, Arizona – Transportation Electrification Action Plan
- Montgomery County, Maryland – Brookville Smart Bus Depot and Equipment Maintenance & Transit Operation Center (EMTOC)
- NCTCOG-ResilientEVChargingInfrastructure-Whitepaper.pdf
- Colorado DOT Resilience Improvement Plan